TOBACCO INDUSTRY RESEARCH COMMITTEE
350 FIFTH AVENUE NEW YORK 1, N. Y.

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Application For Research Grant

Date: May 9, 1955

1. Name of Investigator: Dr. Caroline Bedell Thomas

2. Title: Associate Professor of Medicine

3. Institution & Address: The Johns Hopkins School of Medicine
710 North Washington Street
Baltimore 5, Maryland

4. Project or Subject: The significance of different individual patterns of circulatory response to cigarette smoking.

5. Detailed Plan of Procedure (Use reverse side if additional space is needed): As part of a long term study of the precursors of hypertension and coronary artery disease, using the Johns Hopkins medical students as subjects, we have made preliminary studies of the circulatory patterns produced by cigarette smoking. With the subject lying on a Starr-type ballistocardiograph, the systolic pressure, diastolic pressure, pulse pressure, heart rate, stroke volume, cardiac output and cardiac index were measured before and after smoking. Analysis of tests on the first 113 subjects showed:

1. Whereas the overall mean change after smoking a single cigarette was not great, striking variations were found in individual patterns not only in the degree but in the direction of change (Figures 1 and 2).

2. Where one variable showed a marked deviation in a given direction, the other variables tended to fall into a characteristic pattern (figure 3).

3. When subjects were classified according to age, sex, body weight, blood cholesterol levels, smoking habits or as to whether or not parental histry of hypertension and/or coronary artery disease is present, our results suggest that the pattern of response to smoking may be more closely linked to parental history than to the other factors mentioned (Figures 4 and 5.)

These suggestive preliminary findings are now under detailed statistical analysis. Before their meaning is clear, much more work needs to be done both by studying larger groups of subjects with different types of parental history and by certain other intensive studies. The assistance of a part-time Physiological Fellow is necessary to accomplish these aims.

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6. Budget Plan:

Salaries	$ 1,000.00
Expendable Supplies	100.00
Permanent Equipment	0.00
Overhead	280.00
Other	300.00
Total	$ 1,680.00

7. Anticipated Duration of Work:

One year, beginning in the fall of 1955

8. Facilities and Staff Available:

There is a Starr-type ballistocardiograph and a double-channel Sanborn Viso-cardiette available as well as ample work space in conjunction with our major project, access to our records, and secretarial assistance. The work will be under my immediate direction.

9. Additional Requirements:

In addition to the salary item for the Fellow and $100 to cover the cost of certain pharmacological products to be used in connection with his work, the $300 item under "other" will provide a small weekly sum for ballistocardiographic measurements and calculations to be carried out by a trained medical student paid at an hourly rate. (See Appendix A and B)

10. Additional Information (Including relation of work to other projects and other sources of supply):

The smoking test studies are to be carried out in conjunction with Grant H-1891 (c) under the Public Health Service, National Institutes of Health, entitled "A Study of The Precursors of Hypertension and Coronary Artery Disease." That budget does not provide for the items here requested.

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Signature /s/ Caroline Bedell Thomas
Director of Project

/s/ Philip Reed
Business Officer of the Institution
xxxxxxxxxxxxxxxxxxxxx Dean & Budget Officer

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Figure 1

The pattern of the mean circulatory changes of 113 healthy young adults in response to smoking one cigarette.

SP = systolic pressure DP = diastolic pressure PP = pulse pressure

HR = heart rate SV = stroke volume CO = cardiac output

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Figure 2

Six different individual patterns of circulatory response to smoking. Each pattern represents the percentage changes in six variables shown by a single subject immediately after smoking one cigarette compared with his own control values. (Legend as in Figure 1).

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Figure 3

Patterns of circulatory response to smoking among twelve selected groups. Each pattern represents the mean changes for the ten subjects having the greatest unidirectional change of the index determinant as indicated in the subtitle.

= index determinant

= associated determinants

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Figure 4

The patterns of circulatory response to smoking among smokers versus non-smokers.

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Figure 5

The patterns of circulatory response to smoking among subjects with parental history of hypertension versus subjects with normal parents and subjects with parental history of coronary artery disease.

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